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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,339	09/23/2003	Shogo Hirose	117255	9283
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EXAMINER				
LEUNG, JENNIFER A				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/667,339

Applicant(s)

HIROSE ET AL.

Examiner

JENNIFER A. LEUNG

Art Unit

1797

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 May 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-21 is/are pending in the application.
- 4a) Of the above claim(s) 13-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-12 and 16-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S5108)
Paper No(s)/Mail Date 5-15-08
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed on May 15, 2008 has been carefully considered. Claim 3 is cancelled. Claims 13-15 are withdrawn. Claims 1, 2, 4-12 and 16-21 are under consideration.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1, 2, 4, 10-12 and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwamoto et al. (US 5,853,459) in view of Hijikata et al. (US 5,566,545) and Tomita et al. (US 4,464,185).

Regarding claims 1, 2, 4, 10, 16 and 21, Kuwamoto et al. discloses a system for purifying an exhaust gas containing carbon particulates, said system comprising: a honeycomb structure (i.e., exhaust gas filter **15a**, **15b**, FIG. 3; shown in detail in FIGS. 1, 2) comprising,
a plurality of through channels (i.e., through holes **3**) separated by porous

partition walls (i.e., through hole diaphragms **2**) and extending in an axial direction of the honeycomb structure; wherein all of said through channels **3** have plugging portions (i.e., sealing portions **4**), respectively that plug alternately at either one end of the honeycomb structure or its opposite end in a checkered flag pattern (see FIG. 2); and heating means (**17a**, **17b**; FIG. 3) for burning the particulate materials filtered by the honeycomb structure **15a,15b** to regenerate a filterability.

Kuwamoto et al. is silent as to the honeycomb structure **15a,15b** comprising at least one slit per through channel formed only in the vicinity of the plugging portion of the partition walls surrounding the respective through channels.

Hijikata et al., however, teaches a honeycomb structure (i.e., an exhaust gas filter **30**) defining a plurality of through channels **33** comprising downstream plugging portions (i.e., sealed portions **34**), relative to the direction of the exhaust gas flow. Hijikata et al. further teaches the provision of at least one slit (i.e., an auxiliary pulse gas stream channel **36**) only in the vicinity of the plugging portions **34**. (see FIGs. 4, 7). The at least one slit **36** creates a passageway for directing a pulse gas stream into the through channels **33** in the immediate vicinity of the plugging portions **34**, to thereby regenerate the filterability of the honeycomb structure by removing the particulates **53** that tend to undesirably accumulate behind the plugging portions **34** during use (see column 8, lines 16-61; FIGs. 8A-C, 9).

It would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the honeycomb structure **15a,15b** in the apparatus of Kuwamoto et al. to comprise at least one slit per through channel formed only in the vicinity of the plugging portions of the partition walls surrounding the respective through channels, because the at least one slit

would create a passageway for directing the gas stream (i.e., from blowing means 22) into the through channels in the immediate vicinity of the downstream plugging portions 4 (relative to the exhaust gas flow), to thereby regenerate the filterability of the honeycomb structure 15a, 15b by removing the particulates that tend to undesirably accumulate behind the plugging portions of the honeycomb structure during use, as suggested by Hijikata et al.

Although Hijikata et al. does not specifically teach the claimed dimensions for each slit, the claimed dimensions do not confer patentability to the claim, since the precise dimensions for each slit would have been considered a result effective variable by one having ordinary skill in the art, as evidenced by Tomita et al. For instance, Tomita et al. teaches a honeycomb structure comprising slits in the form of gas blowing holes 32 or 6 (see FIGs. 2 or 6), wherein,

“The maximum opening area of each blowing pore 32 formed in the separator wall 3 is equal to the sectional area of each axially extending passage 21 or 22. When the opening area of each blowing pore exceeds the sectional area of the passage 21 or 22, almost all the exhaust gases pass through the blowing pores without interfering with the separator walls and are discharged from the outlet passages so that the carbon particles are neither caught nor collected by the filter.” (see column 4, lines 19-28); and

“The pressure loss and the collecting efficiency were measured in relation to the opening area of the exhaust gas blowing holes 6... As a result, the proper opening area of the blowing holes 6 was 0.5 to 10% of the total opening area of the passages 2,” (see column 5, lines 16-24).

Accordingly, one having ordinary skill in the art would have routinely optimized the dimensions of each slit to achieve the desired opening area for each slit, in order to obtain the desired amount of pressure loss and particle collecting efficiency in the system, *In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980), and where the general conditions of a claim are disclosed in the prior

art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 11, Kuwamoto et al. discloses that a sectional shape of the through channel 3 is quadrangular (see, e.g., FIG. 2).

Regarding claim 12, Kuwamoto et al. discloses that the honeycomb structure may be made of cordierite or mullite (see column 6, lines 11-20).

Regarding claim 17, the heating means 17a, 17b of Kuwamoto et al. meets the claim (see column 6, lines 48-53; column 9, lines 10-26).

Regarding claims 18 and 19, Kuwamoto et al. discloses that an internal combustion engine (i.e., a diesel engine 6; FIG. 3) is in communication with the honeycomb structure.

Regarding claim 20, expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim. *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969), and the inclusion of a material or article worked upon by a structure being claimed does not impart patentability to the claims. *In re Young*, 75 F.2d 966, 25 USPQ 69 (CCPA 1935); *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963). Thus, the recitation of a non-burnable material comprising ashes adds no further patentable weight to the claim.

3. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwamoto et al. (US 5,853,459) in view of Hijikata et al. (US 5,566,545) and Tomita et al. (US 4,464,185), as applied to claim 1 above, and further in view of Hidaka et al. (EP 1 128 031).

The collective teaching of Kuwamoto et al., Hijikata et al. and Tomita et al. is silent as to varying the slit length, such that the length of the slits in the vicinity of the outer peripheral

portion of the honeycomb structure is longer than the length of the slits located in a central portion of the honeycomb structure. Hidaka et al., however, teaches a honeycomb structure wherein the length of the slits in the vicinity of the outer peripheral portion of the honeycomb structure is longer than the length of the slits located in a central portion of the honeycomb structure 1 (see section [0054]). It would have been obvious for one of ordinary skill in the art at the time the invention was made to configure the slits in the modified honeycomb structure of Kuwamoto et al. such that the length of the slits in the vicinity of the outer peripheral portion of the honeycomb structure was longer than the length of the slits located in a central portion of the honeycomb structure, on the basis of suitability for the intended use and absent a showing of unexpected results thereof, because such a configuration would enable the filtrate to be more efficiently discharged to the external space, as taught by Hidaka et al.

An increase in slit length is directly proportional to an increase in the slit open area. Although Hidaka et al. is silent as to teaching other means for increasing the slit open area (e.g., by increasing the number of slits at the outer periphery, or by increasing the width of the slits and the outer periphery, whereby the width of the slit would vary from slit to slit), it would have been obvious for one of ordinary skill in the art at the time the invention was made to select other suitable means for increasing the slit open area in the modified honeycomb structure of Kuwamoto et al., on the basis of suitability for the intended use and absent a showing of unexpected results thereof, because the substitution of known equivalent structures involves only ordinary skill in the art, and the substitution of known equivalent techniques, e.g., for enlarging the slit open area at the outer periphery, would have been obvious. *Ex parte Novak* 16 USPQ 2d 2041 (BPAI 1989); *In re Mostovych* 144 USPQ 38 (CCPA 1964); *In re Leshin* 125 USPQ 416

(CCPA 1960); *Graver Tank and Manufacturing Co. v. Linde Air Products Co.* 85 USPQ 328 (USSC 1950); *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958).

4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwamoto et al. (US 5,853,459) in view of Hijikata et al. (US 5,566,545) and Tomita et al. (US 4,464,185), as applied to claim 1 above, and further in view of Manson (US 6,248,689).

Kuwamoto et al. is silent as to the honeycomb structure **15a,15b** carrying an oxidation catalyst. Manson, however, teaches a honeycomb structure **100** that is coated with an oxidation catalyst (see column 4, line 66 to column 5, line 2; and column 5, line 16 to column 6, line 4). It would have been obvious for one of ordinary skill in the art at the time the invention was made to provide an oxidation catalyst on the honeycomb structure in the modified apparatus of Kuwamoto et al., because the oxidation catalyst would help oxidize soot and other hydrocarbonaceous materials found in the exhaust gas of diesel engines at the temperatures normally found in the engine's exhaust manifold, as taught by Manson (see, e.g., column 5, lines 4-11).

Response to Arguments

5. Applicant's arguments with respect to claims 1, 2, 4-12 and 16-21 have been considered but they are moot in view of the new ground(s) of rejection, as necessitated by the amendment to claims 1 and 16 calling for the at least one slit per through channel to be formed only in the vicinity of the plugging portion.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

* * *

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER A. LEUNG whose telephone number is (571)272-1449. The examiner can normally be reached on 9:30 am - 5:30 pm Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jennifer A. Leung/
Primary Examiner, Art Unit 1797